

Claims:

1. A liquid accelerator composed of a fluoride-containing aqueous aluminum salt, which is obtained through the reaction of aluminum sulfate and hydrofluoric acid, aluminum hydroxide, and one or more kinds of lithium salts selected from the group consisting of lithium hydroxides, lithium carbonates, and lithium sulfates.
2. The liquid accelerator according to Claim 1, wherein total alkali is less than 1 %.
3. The liquid accelerator according to claim 1 or 2, characterized in that 15 to 35 % by mass of aluminum sulfate, 1 to 5 % by mass of hydrofluoric acid, less than 15 % by mass of aluminum hydroxide, and 3 to 25 % by mass of one or more kinds of lithium salts selected from the group consisting lithium hydroxides, lithium carbonates, and lithium sulfates are used for the total amount of the liquid accelerator.
4. The liquid accelerator according to any of claims 1 to 3, wherein the ratio A/S of the number of moles of Al_2O_3 (A) to the number of moles of SO_3 (S) in the liquid accelerator is 0.35 to 1.0.
5. The liquid accelerator according to any of claims 1 to 4, wherein the source of SO_3 is one or more kinds of sulfuric compounds selected from the group consisting of sulfuric acids, aluminum sulfates, lithium sulfates, sodium sulfates, and potassium sulfates.
6. The liquid accelerator according to any of claims 1 to 5, wherein one or more members selected from the group consisting of C_1 to C_{10} organic monocarboxylic and dicarboxylic acids and the metallic salts thereof are contained.
7. The liquid accelerator according to any of claims 1 to 6, wherein one or more members selected from the group consisting of alkanolamine, alkylene diamine, and triamine are contained.
8. The use of the liquid accelerator according to any of claims 1 to 7 for sprayed mortar or concrete applied to a dry or wet spraying process.

9. A process of dry or wet spraying wherein the liquid accelerator according to any of claims 1 to 7 is added to a cement composition such as mortar or concrete in a transport pipe, a watering nozzle, or a spray nozzle either directly to the mixture by means of an accelerator feed device, or to the water content.
10. A process of dry or wet spraying characterized in that the liquid accelerator according to any of claims 1 to 7 is added to base mortar or concrete which is added with a high-range AE water-reducing agent and/or a retarder of polycarbonic acid base and which is applied to the spraying process.
11. A liquid accelerator composed of a fluoride-containing aqueous aluminum salt, which is obtained through the reaction of aluminum sulfate and hydrofluoric acid, aluminum hydroxide, and one or more kinds of lithium salts selected from the group consisting of lithium hydroxides, lithium carbonates and lithium sulfates, and wherein the ratio A/S of the number of moles of Al_2O_3 (A) to the number of moles of SO_3 (S) in the liquid accelerator is 0.35 to 1.0.
12. The liquid accelerator according to Claim 11, wherein total alkali is less than 1 %.
13. The liquid accelerator according to claim 11 or 12, characterized in that 15 to 35 % by mass of aluminum sulfate, 1 to 5 % by mass of hydrofluoric acid, less than 15 % by mass of aluminum hydroxide, and 3 to 25 % by mass of one or more kinds of lithium salts selected from the group consisting lithium hydroxides, lithium carbonates, and lithium sulfates are used for the total amount of the liquid accelerator.
14. The liquid accelerator according to any of claims 11 to 13, wherein the source of SO_3 is one or more kinds of sulfuric compounds selected from the group consisting of sulfuric acids, aluminum sulfates, lithium sulfates, sodium sulfates, and potassium sulfates.
15. The liquid accelerator according to any of claims 11 to 14, wherein one or more members selected from the group consisting of C_1 to C_{10} organic monocarboxylic and dicarboxylic acids and the metallic salts thereof are contained.

16. The liquid accelerator according to any of claims 11 to 15, wherein one or more members selected from the group consisting of alkanolamine, alkylene diamine, and triamine are contained.
17. The use of the liquid accelerator according to any of claims 11 to 16 for sprayed mortar or concrete applied to a dry or wet spraying process.
18. A process of dry or wet spraying wherein the liquid accelerator according to any of claims 11 to 16 is added to a cement composition such as mortar or concrete in a transport pipe, a watering nozzle, or a spray nozzle either directly to the mixture by means of an accelerator feed device, or to the water content.
19. A process of dry or wet spraying characterized in that the liquid accelerator according to any of claims 11 to 16 is added to base mortar or concrete which is added with a high-range AE water-reducing agent and/or a retarder of polycarbonic acid base and which is applied to the spraying process.